

colour in living specimens is brownish with three black longitudinal stripes on the dorsum.

Distribution.— *India*: Amatulla, between Jhumla and Moshing, Dorkochu, Shergaon village, Sangloo and Domkho in Kameng Distt. (Chandra 1970) and Chowkham, Wakro in Lohit Distt. (present record) in Arunachal Pradesh; Assam; Sikkim; W. Bengal; Uttar Pradesh; Meghalaya.

Outside India: Burma, Indonesia.

***Haemadipsa zeylanica agilis* Moore**

Material.— 1 ex; Damin (Subansiri Distt.); under stones near a stream; alt. 1100 m; 20.i.75.

Remarks.— *H. z. agilis* is commonly found in forests and grasslands. It is known to attack cattle and man, and can be easily recognised by the dark-blotched pattern on the dorsum.

Distribution.— *India*: Ankaling village in Kameng Distt. (Chandra 1970), Damin in Subansiri Distt. (present record) in Arunachal Pradesh;

HIGH ALTITUDE ZOOLOGY FIELD STATION,
ZOOLOGICAL SURVEY OF INDIA,
SOLAN-173 212 (H.P.),

February 12, 1979.

desh; Uttar Pradesh; Himachal Pradesh; Tamil Nadu; Kerala.

Outside India: Nepal.

***Haemadipsa zeylanica montivindicis* Moore**

Material.— 2 ex; Tihun (Lohit Distt.); under stones near a stream in a dense forest; alt. 1260 m; 13.xii.69.

Remarks.— This species is very common in forests of the eastern Himalayas. It often attacks cattle and man. Dark-blotched pattern on the dorsum is obscure or absent.

Distribution.— *India*: Ankaling village in Kameng Distt. (Chandra 1970), Tihun in Lohit Distt. (present record) in Arunachal Pradesh; Sikkim; Assam; W. Bengal.

Outside India: Nepal, Burma.

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26. SOME INTERESTING OBSERVATIONS ON A SPIDER
ARGIOPE ARCUATA SIMON (ARACHNIDA: ARANEIDAE)

During the course of desert locust survey conducted along the Indo-Pak border area during August-September 1976, some interesting observations were recorded on an orb weaving spider, *Argiope arcuata* Simon.

Habitat: The habitat of this spider was in most difficult and inaccessible desert tracts

comprising high sand dunes with narrow basins. Even in this habitat their population was confined to the narrow basin and lower edges of the sand dunes as the population of Acridids was heavy in the areas. Not a single spider was detected at the top of the high sand dunes or their upper slopes. The webs

were mostly found on woody shrubs growing in the basins but sometimes they were also seen on luxuriantly growing herbs such as *Boerhavia elegans* Choisy. The habitats of grasshoppers and that of this species of spider are almost the same.

Food and feeding habits: The web formed by this spider is an efficient trap even for very large insects; the gossamer being quite strong. In its web, nymphs and adults of grasshopper such as *Acrotylus* sp., *Oedaleus* sp., *Chrotogonus trachypterus*, *Thisioecertus littoralis*, *Ochrilida* sp., *Truxalis exima exima*, bugs, dung rollers and other beetles, some unidentified caterpillars and that of *Celerio* sp. were detected. At two places *Solitaria* hoppers of 4th instar of the desert locust were also found. On one occasion one *Truxalis* adult got entangled in its web but by struggling hard it escaped. It is interesting to note that large insects such as grasshoppers etc. when trapped in the web are further rendered helpless by being speedily fastened with silky thread on the legs and wings of the prey insect by the spider, and this ultimately causes death of the prey.

As many as eight insects were found in the skins of one web. Bhatia and Singh (1966)¹ recorded *Argiope* sp. as predator of the desert locust adults and hoppers from Bikaner district but it is not known to which species, the spider belonged. It appears that many species of *Argiope* may be predated on nymphs and adults of grasshoppers and desert locust.

Cannibalism: Some instances of cannibalism were also observed.

Predators: Lizards are predators of this spider. Several specimens of *Acanthodactylus*

cantoris cantor and Skink *Ophiomorus tridactylus* and *Calotes versicolor* were dissected and spiders of this species were found in their gut contents. Some passerine birds also predate upon these spiders when they move from one place to another.

Population: I have frequently visited border areas of Barmer and Jaisalmer districts from 1974 to 1977 but only during August-September 1976 a significant population of this spider was noted. Maximum number of spiders per bush was two individuals. Prior to 1976, a web of this spider was seldom seen; obviously populations were extremely low, thus escaping notice.

The number of the spiders was generally five per square metre in Dhanana-Murar area (Jaisalmer). The population explosion (approximately 2000 per hectare) observed during 1976 was most probably due to availability of ample insect food and good vegetation during 1975 to 1976 in view of good rains.

Distribution: The spiders of this species have been collected from Sundra area of Barmer district and Dhanana-Murar area of Jaisalmer district during September 1976. It was commonly met with in the desert belt from Sundra (Barmer) 25° 05' N, 71° 07' E to Dhanana-Murar (Jaisalmer) 26° 42' N, 70° 12' E during 1976. It is just possible that the belt of its distribution may be further extended into Bikaner district along the Indo-Pak border, being of similar terrain, vegetation and insect fauna. This appears to be the first record of its occurrence from these districts.

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¹Bhatia, D. R. & Singh, Charan (1966): Natural enemies of the desert locust (*Schistocerca gregaria* Forsk.). *Plant Protection, Bull.* 18 (1-2): 14-17.

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LOCUST WARNING ORGANISATION,
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May 29, 1978.

CHARAN SINGH

27. OBSERVATIONS ON THE SILK CHAMBER CONSTRUCTION AND BROODING BEHAVIOUR OF PSEUDOSCORPIONS (CL. ARACHNIDA)

(With five text-figures)

It is the habit of pseudoscorpions to build chambers of silk which are used for breeding, moulting and hibernation (Gabbutt and Vachon 1965). The silk chamber is generally constructed with the help of the spinneret or galea, situated at the distal end of the fixed finger of chelicera (fig. 1a). The silk glands lie in the prosoma and ducts pass along the fixed finger and open at the tip of the galea (fig. 1b) or the spinneret. Savory, T.H. (1935) pointed out the homology of the silk apparatus with that of the poison apparatus of Araneae. It is to this presence of the silk glands in the chelicerae, the false scorpions owe the name chelonethi, given by Thorell.

By the issue of silk glands, the chambers of silk are constructed in damp places underneath the barks of trees by the bark dwelling forms or under decaying leaves of debris by litter inhabiting pseudoscorpions. It is of interest to know whether the method of construction, the period of nesting and the reaction towards external disturbance differ among the members of the three different suborders namely *Monosphyronida*, *Diplosphyronida* and *Heterosphyronida*, inhabiting different habitats. Furthermore, extensive work has been done in the field of population dynamics

of pseudoscorpions in different parts of the world (Kew 1914; Morikawa 1962; Gabbutt and Vachon 1965). However, during the studies they have failed to take into consideration nested forms, which may influence the population fluctuation remarkably. In this connection, a statistical allowance has been thought of during the present investigation.

METHODS

Tullgrenius indicus, *Calocheiridius elegans* and *Lechytia indica* were taken up for observation as members of the suborders namely *Monosphyronida*, *Diplosphyronida* and *Heterosphyronida* respectively. For each species 10 individuals were observed at the time of nesting, moulting, brooding and hibernation with reference to their behaviour variations.

OBSERVATIONS

Tullgrenius indicus : (Table-1): This species was seen beneath the bark of tamarind trees. During breeding season, the gravid female carries 10 to 12 eggs attached to the genitalia as a spherical mass and covered by a thin membrane. With the help of the branched galea the female deposits the silk in an irregular fashion between the stem and the bark